

Кокушев Даниил Александрович

Тюменский государственный университет
Институт математики и компьютерных наук
Кафедра иностранных языков и межкультурной
профессиональной коммуникации
Студент группы 25МиР1610

daniil.kokushev.98@mail.ru

Гаркуша Надежда Анатольевна

Тюменский государственный университет
Институт Математики и Компьютерных Наук
Кафедра иностранных языков и межкультурной
профессиональной коммуникации

Доцент, канд. пед. наук

n.a.garkusha@utmn.ru

РОБОТЫ В СТРОИТЕЛЬСТВЕ

Kokushev Daniil Alexandovich

University of Tyumen
Institute of Mathematics and Computer Sciences
Foreign Languages and Intercultural
Professional Communication Department
Student of 25MiR1610 gr.

daniil.kokushev.98@mail.ru

Garkusha Nadezhda Anatolievna

University of Tyumen
Institute of Mathematics and Computer Sciences
Foreign Languages and Intercultural
Professional Communication Department
Associate Professor, Candidate of Pedagogic Sciences

n.a.garkusha@utmn.ru

ROBOTS IN CONSTRUCTION

АННОТАЦИЯ. Целью данной статьи является рассмотреть различные виды роботов, используемых в строительстве, и выделившихся роботов данного направления. Роботы могут улучшить строительство, ускоряя производство и делая его менее опасным; они также могут работать с тяжелыми грузами, вредными материалами.

КЛЮЧЕВЫЕ СЛОВА: робототехника, роботы, строительство, производство.

ABSTRACT. The purpose of this article is to consider the different types of robots used in construction, and the highlighted robots of this direction. Robots can improve construction speeding up production and making it less dangerous; they can also work with heavy loads, harmful materials.

KEY WORDS: robotics, robots, construction, production.

Today, robots play an important role in the development of technologies for the construction of structures and various objects, and over time they will become more and more common in daily business.

Most construction jobs are boring, laborious, and dangerous. This is exactly what is suitable for automated robots. Robots have the speed, dexterity, and strength necessary to move the construction to a new level, improve it. From laying bricks to working with thin, fragile windows, they have the potential to become a valuable and basic part of future "construction."

Robots are ideal workers when it comes to packaging and packaging of building products. Some robots were even used to build finished walls. Some believe that building robots will lead to a new, innovative architecture.

The concept of "Robot".

A robot is an automatic device with an anthropomorphic action that partially or completely replaces a person when performing work in life-threatening conditions, with relative inaccessibility of the facility or for other uses.

The robot can be operated by the operator or can work according to a pre-programmed program. The use of robots makes it possible to facilitate or completely replace human labor in production, in construction, in routine work, in handling heavy loads, harmful materials, and in other heavy or unsafe conditions for humans.

Humanoid robot (after its creation) will be the first universal tool, as it will be able to use the widest set of any technical tools already made by man for himself.

The emergence of CNC machines led to the creation of programmable manipulators for a variety of operations for loading and unloading machine tools. Appearance in the 70's of microprocessor control systems and the replacement of specialized control devices with programmable controllers have reduced the cost of robots by three times, making it cost-effective for their mass introduction in the industry. This was facilitated by objective prerequisites for the development of industrial production.

Machines used in construction.

- Construction cranes.

Construction cranes are widely used in civil, industrial, power and hydrotechnical construction for assembly work, as well as for vertical and horizontal movement of goods. They also find application in warehouses and ranges of enterprises of the construction industry. From other types of cranes, tower cranes are characterized by a high boom position, which together with a sufficient outreach of the hook provides a large under-shooting space in which the erected building can be accommodated.

- Pneumatic vacuum unloaders.

Pneumatic vacuum unloaders of cement are used for unloading cement from covered wagons. The vacuum unloader of cement consists of a self-propelled sampling device, a flexible cement-bonding hose, a precipitation chamber with bag filters, a screw feeder, an air duct, and a vacuum pump.

- Pneumatic transport.

In installations of pneumatic transport the material is moved by the air flow through pipelines in suspension or in containers (capsules).

Pneumatic transport units are used in the construction industry to transport bulk materials (cement, dry sand, fine coal, chips, sawdust). When using containers, gravel and other materials can also move.

The advantage of pneumatic conveying systems is the ability to move materials in any direction and simultaneously in several points.

Interesting facts and information about the dedicated robots-builders.

- Robot-destroyer from Husqvarna.

The company Husqvarna introduced the first in its kind of building robot-destroyer, capable of working in difficult or dangerous for human conditions. The specialization of the apparatus is the dismantling of large structures and the demolition of partitions inside the building.

The device is able to move independently. This robot is equipped with two caterpillars, which can move so that the robot can squeeze into the doorways.

For robustness on uneven surfaces, the robot has four "paws", allowing gaining a foothold for work in a stationary mode. The machine is controlled remotely by means of a remote control and is capable of operating a variety of attachments: a jackhammer, claws or a bucket of an excavator.

- Robots builders conquer the moon.

Robots may be the first construction workers on the moon, according to a recent NASA study.

The report says that two remote-controlled robots were able to build a landing pad for the lunar station in less than six months - besides it is safer and cheaper than if people were building.

NASA plans to create a lunar station by 2024. An excellent human habitation will be created, with protection from possible meteorites and cosmic anomalies.

But still there is a problem with the landing of a passenger vehicle on special sites.

The researchers concluded that a pair of 150-kilogram robots, about the size of a lawn mower, would do this job best. The main mission of the robots would be to

stabilize areas of free lunar soil and install a 2.6-meter-high wall around these special sites.

The researchers say they need more information about the conditions of the soil in the lunar poles - the most suitable locations for the station - before they can build a construction prototype robot.

References

1. Kazagachev V. N, Karakoyshev A. Zh., Yeshchanova S. U. Introduction of the elective course of robotics for bachelors-builders // Young Scientist. - 2015. - № 20. - C. 452-455. - URL <https://moluch.ru/archive/100/22461/> (date of circulation: June 13, 2018).
2. Shagina E. S. Robotization as a method of improving the safety of construction production. // Construction of unique buildings and structures. -2014. - No. 6 (21). - C.128-147
3. Kazagachev V.N., Gulyuta AA Introduction of the concept of "robot" and "robotics" in education // Postgraduate student and competitor. -2015. - No. 4. - P. 45-47.
4. Automation and robotization of construction: Proc. allowance / A.Г. Bulgakov, V.A. Vorobiev, S.I. Evtushenko, D.Ya. Parshin. - M. : RIOR: INFRA-M, 2013. - 452 p.
5. Automation of the construction industry / A.G. Bulgakov and others. South-Russian. state. tech. un-t. - Novocherkassk: YURSTU, 2006. - 268 p.
6. Parshin D.Ya. Fundamentals of automation and robotics / RSSU - Rostov n / D, 2013. - 147 p.